DOCUMENT RESUME

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TITLE Math 3013--Developmental Mathematics I and II. Course Outline.
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ABSTRACT

This document contains the course syllabus and 12 independent practice modules for an introductory college algebra course that requires some previous knowledge of algebra and the ability to work at a rapid pace. Topics include the basic operations with signed integers; fractions; decimals; literal expressions; algebraic fractions; radicals; percent; factoring; laws of exponents; scientific notation; first degree, quadratic, fractional and absolute value equations; determinants; functions; and graphs. Information given in this syllabus includes: (1) textbook; (2) references; (3) grading criteria; (4) course description; (5) prerequisites; (6) behavioral objectives; and (7) course outline. (CW)

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ED296903

NEW YORK INSTITUTE OF TECHNOLOGY
CENTER FOR THE NATURAL SCIENCES
DEPARTMENT OF DEVELOPMENTAL MATHEMATICS

COURSE OUTLINE

MATH 3013 - DEVELOPMENTAL MATHEMATICS I & II - 4 credits/5 hours per week

TEXT: INTRODUCTORY ALGEBRA, 2nd Edition, Wright & New, Allyn and Bacon, Inc.

INSTRUCTOR:_____ OFFICE TELEPHONE:_____

OFFICE LOCATION:_____ OFFICE HOURS:_____

GRADING CRITERIA:

Exams (3)	39%
Quizzes	13
Homework Modules	20
Final (departmental and comprehensive)	28
	100%

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COURSE DESCRIPTION:

The course requires some previous knowledge of algebra, and the ability to work at a rapid pace. The topics include the basic operations with signed integers, fractions, decimals, literal expressions, algebraic fractions and radicals. Also included are percent, factoring, laws of exponents, scientific notation, equations (first degree, quadratic, fractional, absolute value), determinants, functions and graphs.

COURSE PROCEDURES:

The curriculum is broken into twelve modules, each of approximately one week's length. At the end of each module, the student completes a set of exercises relating to the topic(s) covered. The student is urged to use both his class notes and the worked examples in the text as references. Three classroom tests are to be administered - upon completion of the fourth, eighth and twelfth weeks of study. Also, in the weeks with no exam, a short quiz on current work will be given. Through the implementation of the exams, quizzes and modules, the student will receive frequent feedback regarding his or her progress.

BEHAVIORAL OBJECTIVES:

An attitude that encourages academic progress in mathematics by utilizing one's maximum learning potential.

ATTENDANCE:

Full attendance is required. For medical and other problems, one week of absence will be permitted.

MAKE-UP EXAMINATIONS:

All make-ups are to be taken within one week after the test date.

SMOKING AND EATING:

Neither will be permitted in the classroom.

Rev. 6/87

SE 049 442

NEW YORK INSTITUTE OF TECHNOLOGY
CENTER FOR THE NATURAL SCIENCES
DEPARTMENT OF DEVELOPMENTAL MATHEMATICS

COURSE OUTLINE

MATH 3013: DEVELOPMENTAL MATHEMATICS I & II
TEXTBOOK: INTRODUCTORY ALGEBRA, Second Edition, D. Franklin Wright and Bill D. New, Allyn and Bacon, Inc., 1986.

USE OF A CALCULATOR IS NOT PERMITTED IN THIS COURSE.

WEEK	SECTION	TOPIC
1	1.1	Operations with whole numbers
	1.2	Exponents and order of operations
	1.3-1.4	Operations with fractions
	Supplement	Operations with mixed numbers
2	2.1	Number lines (include distance from origin)
	2.3-2.5	Operations with signed numbers
	1.7	Variables and solutions to equations
3	1.8	Use of formulas in geometry
	3.1	Simplifying and evaluating expressions
	3.2-3.4	Solving equations (include parenthesis p.123)
4	1.5	Decimals and percent
	Supplement	Division with decimals
	Supplement	Conversion from fractions to decimals and from decimals to fractions
	Supplement	Additional percent problems
5	3.5	Writing algebraic expressions
	3.6	Word problems
	3.7	Solving for any term in a formula
6	4.1-4.2	Exponents and scientific notation
	4.3-4.4	Operations with polynomials
	4.5	Special products of binomials
7	6.1	Division with polynomials
	5.1-5.3	Factoring polynomials
	5.4	Solving quadratic equations by factoring
	5.7	Additional factoring - review
8	6.2-6.3	Operations with rational fractions
	6.4	Elementary complex expressions p.259/1-22
	7.1	Fractional equations
9	8.1-8.5	Graphing linear equations (include $y = mx + b$ and $y - y_1 = m(x - x_1)$
10	9.1-9.3	Systems of linear equations
11	10.1-10.3	Real numbers and radicals
12	11.2	The quadratic formula
	5.5,7.3	Applications (no distance)
13	Supplement	Basic geometry

MATH 3013 - MODULE 1

1.
$$\begin{array}{r} 754 \\ 1323 \\ 219 \\ +\ 88 \\ \hline \end{array}$$

a) 2483 b) 1494 c) 2374 d) 2384 e) 2274

2. $13 + 28 + 19 + 2 =$

a) 63 b) 62 c) 52 d) 42 e) 61

3.
$$\begin{array}{r} 483 \\ -287 \\ \hline \end{array}$$

a) 185 b) 296 c) 196 d) 194 e) 286

4. $83 - 29 =$

a) 54 b) 43 c) 55 d) 53 e) 64

5. $(143)(27)$

a) 3718 b) 3834 c) 3861 d) 4032 e) 3600

FIND THE LCM FOR EACH SET OF NUMBERS IN EXERCISES #6 THROUGH #9.

6. 18 and 24

a) 24 b) 18 c) 36 d) 48 e) 72

7. 20 and 14

a) 70 b) 140 c) 20 d) 130 e) 280

8. 24, 36 and 48

a) 144 b) 48 c) 96 d) 140 e) 228

9. 30, 40 and 70

a) 160 b) 420 c) 840 d) 210 e) 350

SIMPLIFY AND REDUCE TO THE LOWEST TERMS EACH EXPRESSION IN EXERCISES #10 THROUGH #25.

10. $(4^2 + 6) \div 11 - 1(2)$

a) $2\frac{4}{9}$ b) 0 c) $-2\frac{4}{9}$ d) 1 e) 2

11. $3^3 \div 9 + (6 + 4^2) \div 2$

a) $12\frac{1}{2}$ b) 2 c) 14 d) $12\frac{3}{4}$ e) 11

12. $\frac{120}{150}$

a) $\frac{3}{7}$ b) $\frac{2}{5}$ c) $\frac{4}{7}$ d) $\frac{4}{5}$ e) $\frac{3}{5}$

13. $(\frac{36}{65}) \cdot (\frac{75}{90})$

a) $\frac{12}{26}$ b) $\frac{6}{13}$ c) $\frac{13}{6}$ d) $\frac{3}{5}$ e) $\frac{9}{28}$

14. $(\frac{40}{9}) \div (\frac{2}{15})$

a) $\frac{25}{3}$ b) $\frac{50}{3}$ c) $\frac{100}{3}$ d) $\frac{18}{5}$ e) $\frac{26}{11}$

15. $(2) \cdot (1\ \frac{2}{5}) \div (\frac{7}{12})$

a) $\frac{49}{30}$ b) $\frac{18}{11}$ c) $\frac{22}{25}$ d) $3\ \frac{3}{5}$ e) $4\ \frac{4}{5}$

16. $(2\ \frac{2}{3}) \cdot (\frac{18}{5}) \cdot (\frac{5}{4})$

a) 6 b) $\frac{3}{4}$ c) 12 d) $\frac{4}{3}$ e) 5

17. $\frac{7a}{18} \cdot \frac{9}{28} \div \frac{3x}{10}$

a) $\frac{5a}{12x}$ b) $\frac{35a}{84x}$ c) $\frac{5}{12}$ d) $\frac{7a}{12x}$ e) $\frac{7}{12}$

18. $\frac{7}{12} + \frac{8}{15}$

a) $\frac{15}{27}$ b) $\frac{18}{21}$ c) $\frac{43}{60}$ d) $\frac{55}{60}$ e) $\frac{67}{60}$

19. Multiply the quotient of 19/2 and 13/4 by 13/12

a) 6/5 b) 19/6 c) 6/19 d) 26/57 e) 3/2

20. How much space on a shelf will John need to hold 3 books 3/4" thick and 4 books 7/8" thick?

a) 21/4" b) 21/8" c) 21/32" d) 33/4" e) 23/4"

21. $\frac{8}{35} + \frac{6}{10} - \frac{5}{14}$

a) $-\frac{33}{70}$ b) $\frac{83}{70}$ c) $-\frac{83}{70}$ d) $\frac{23}{70}$ e) $\frac{33}{70}$

22. $\frac{3}{4} + \frac{1}{2} - (\frac{1}{3})(\frac{3}{2})$

a) $\frac{3}{4}$ b) $\frac{7}{4}$ c) $\frac{7}{8}$ d) $\frac{4}{3}$ e) $\frac{3}{2}$

23. $\frac{1}{2}(\frac{3}{4} + \frac{1}{6}) + \frac{2}{3}$

a) $\frac{6}{5}$ b) $\frac{7}{6}$ c) $\frac{5}{4}$ d) $\frac{9}{8}$ e) $\frac{7}{4}$

24. $\frac{3}{4} \div \frac{3}{16} - \frac{2}{3} \cdot \frac{3}{4}$

a) $\frac{2}{7}$ b) $-\frac{7}{2}$ c) $\frac{7}{2}$ d) $-\frac{2}{7}$ e) 2

25. $(\frac{2}{3} - \frac{1}{5}) \div (\frac{5}{7} - \frac{1}{3})$

a) $\frac{7}{8}$ b) $\frac{147}{40}$ c) $-\frac{49}{40}$ d) $\frac{56}{315}$ e) $\frac{49}{40}$

1. $342 - (-43)$

   a) 299 b) 399 c) 285 d) 385 e) 395

2. $(-9) + (-2) + (-5)$

   a) 16 b) -16 c) -17 d) 15 e) 17

3. $-38 + 49 + (-6)$

   a) 6 b) -5 c) -6 d) 7 e) 5

4. $-4\frac{2}{3} + (-5\frac{1}{6})$

   a) $9\frac{5}{6}$ b) $\frac{58}{6}$ c) $8\frac{5}{6}$ d) $-9\frac{5}{6}$ e) $-8\frac{5}{6}$

5. $1335 + 120 - 168 - 4$

   a) 1200 b) 1283 c) 128 d) 1300 e) 1900

6. $16 - (-8)$

   a) 8 b) -8 c) 24 d) -24 e) 4

7. $-3 - (-3) + (-6)$

   a) 18 b) -6 c) -18 d) 0 e) 6

8. $-\frac{2}{3} + \frac{4}{5} - (-\frac{1}{2})$

   a) $\frac{14}{15}$ b) $\frac{19}{30}$ c) $\frac{7}{30}$ d) $-\frac{7}{30}$ e) $-\frac{19}{30}$

9. $\frac{4}{3} - \frac{1}{4} - \frac{5}{6}$

   a) $-\frac{29}{4}$ b) $-\frac{1}{3}$ c) $-\frac{1}{4}$ d) $\frac{29}{4}$ e) $\frac{1}{4}$

SELECT THE CORRECT ANSWER THAT FOLLOWS FOR EXERCISES #10 THROUGH #12.

10. $-2 - 3$ _____ 5

    a) $-5 < 5$ b) $6 > 5$ c) $5 = 5$ d) $-6 > 5$ e) $-6 < 5$

11. $2 - 6$ _____ $-3 - 4$

    a) $-12 < 7$ b) $4 > -17$ c) $8 > 7$ d) $-4 > -7$ e) $-4 < -7$

12. $-4 - 3$ _____ $-2 - (-2)$

    a) $7 > 0$ b) $7 > 4$ c) $-7 < -4$ d) $-12 > 0$ e) $-7 < 0$

13. $19(-4) \div 4$

    a) 20 b) 36 c) 19 d) -19 e) 190

14. $(-\frac{1}{8})(-\frac{4}{3})$

a) $-\frac{1}{6}$ b) $\frac{1}{6}$ c) $\frac{2}{3}$ d) $-\frac{2}{3}$ e) $\frac{1}{12}$

15. $(-6)(-3)(-9)$

a) 121 b) -162 c) 154 d) -154 e) 162

16. $(-7)\cdot(-16)\cdot 0$

a) 112 b) -112 c) 28 d) 42 e) 0

17. $(-\frac{1}{2}) \div (-\frac{7}{8})$

a) $\frac{4}{7}$ b) $-\frac{7}{16}$ c) $-\frac{7}{4}$ d) $-\frac{4}{7}$ e) $\frac{16}{7}$

18. $\dfrac{15 + (-5) \div (-1)}{5}$

a) -2 b) 2 c) -4 d) 3 e) 4

19. $3(-6)(-4) \div 6 + 3(2)$

a) -18 b) 12 c) 18 d) -12 e) 6

20. $\dfrac{99 - 66}{19 + (-8)}$

a) 4 b) -3 c) 3 d) 6 e) 5

21. $\dfrac{4 + (3 - 3)}{2(3 - 3)}$

a) 2 b) 0 c) 4 d) $\frac{7}{2}$ e) undefined

EVALUATE THE FOLLOWING.

22. $x + 6$, $x = 2$

a) 8 b) -8 c) 6 d) 2 e) -2

23. $12 - 3x$, $x = -2$

a) -18 b) 12 c) -12 d) 18 e) 9

24. $2y + 4 + 4y$, $y = 3$

a) 18 b) 12 c) 22 d) -10 e) -16

25. $4x + 6$, $x = -3$

a) 6 b) -6 c) -1 d) -18 e) 4

EVALUATE THE FOLLOWING.

1. The perimeter of a rectangle with a length of 15 inches and a width of 20 inches is _____ inches.

   a) 70 b) 60 c) 75 d) 55 e) 65

2. The area of rectangle in problem #1 is _____ square inches.

   a) 250 b) 280 c) 150 d) 320 e) 300

3. The circumference of a circle with a radius of 3 centimeters is _____ centimeters.

   a) 9.42 b) 18.84 c) 28.26 d) 18.47 e) 19.23

4. The area of the circle in problem #3 is _____ square centimeters.

   a) 9.42 b) 28.26 c) 18.84 d) 18.47 e) 19.23

5. The area of a triangle with a height of 3 feet and a base of 4 feet is _____ square feet.

   a) 3 b) 4 c) 6 d) 8 e) 12

6. The area of a parallelogram with a height of 2 meters and a base of 10 meters is _____ square meters.

   a) 2 b) 4 c) 15 d) 10 e) 20

7. The volume of a sphere with a radius of 5 feet is _____ cubic feet.

   a) 480 b) 523 c) 325 d) 820 e) 565

8. The volume of a rectangular pyramid with a length of 2 feet, a width of 1.5 feet and a height of 4 feet is _____ cubic feet.

   a) 2 b) 4 c) 3 d) 5 e) 8

9. The volume of a cylinder with a diameter of 4 inches and a height of 20 inches is _____ cubic inches.

   a) 251 b) 122 c) 356 d) 294 e) 334

SIMPLIFY AND COMBINE.

10. $4x - 3y + 2(x + 2y)$

    a) $6x - 5y$ b) $6x + y$ c) $6x + 5y$ d) $2x + 5y$ e) $-2x - 5y$

11. $5(x - 2) - 8 - 3(x - 4) + 13$

    a) $8x + 3$ b) $8x - 3$ c) $2x + 7$ d) $2x - 19$ e) $2x - 40$

12. $2(x^2 + 3x) + 4(-x^2 + 2x)$

    a) $2x^2 - 14x$ b) $-2x^2 + 14x$ c) $4x^2 + 2x$ d) $-6x^2 + 14x$
    e) $-4x^2 + 2x$

SOLVE FOR THE UNKNOWN.

13. $\frac{2x}{5} = 15$

a) 3 b) 6 c) $1\frac{1}{2}$ d) $7\frac{1}{2}$ e) $37\frac{1}{2}$

14. $x + \frac{3}{8} = \frac{5}{16}$

a) $\frac{1}{16}$ b) $-\frac{1}{16}$ c) $\frac{1}{4}$ d) $-\frac{1}{4}$ e) $\frac{11}{16}$

15. $25x = 75 + x$

a) 3 b) $\frac{75}{26}$ c) $3\frac{3}{8}$ d) $\frac{10}{3}$ e) $3\frac{1}{8}$

16. $6x - 2 + 3x = 4x + 8 + 4x$

a) -10 b) 8 c) 10 d) 6 e) 12

17. $4x - 7x = 42$

a) -14 b) 14 c) 3 d) -2 e) 21

18. $\frac{5}{6}y = 17 + 23$

a) -48 b) 8 c) 48 d) -8 e) 23

19. $8(3x + 5) - 9 = 9(x - 2) + 14$

a) $\frac{7}{3}$ b) $\frac{3}{7}$ c) $-\frac{3}{7}$ d) $-\frac{7}{3}$ e) 2

20. $10x - \frac{1}{2} = 9x - \frac{9}{10}$

a) $-\frac{2}{5}$ b) $\frac{2}{5}$ c) $-\frac{1}{10}$ d) $\frac{4}{5}$ e) $\frac{1}{10}$

21. $8x + 6 = 7x + 6$

a) 1 b) -1 c) 2 d) 0 e) -2

22. Eighty-four feet of fencing is needed to enclose a small garden plot. If the plot is 18 feet wide, find the length.

a) 12 b) 24 c) 16 d) 48 e) 18

23. Find the cost if the profit is $93.25 and the revenue is $865.90.

a) $773.70 b) $762.65 c) $772.60 d) $862.65 e) $772.65

24. One year a person earned a salary of $23,400. This was $1700 more than last year. What was last year's salary?

a) $21,770 b) $20,000 c) $21,700 d) $11,700 e) $20,700

25. A rectangle is 37 inches long and has a perimeter of 122 inches. Find the width of the rectangle.

a) 24 b) 12 c) 48 d) 74 e) 36

FOR PROBLEMS #1 THROUGH #3, CONVERT THE FOLLOWING DECIMALS TO FRACTIONS OR MIXED NUMBERS. REDUCE TO LOWEST TERMS.

1. 0.36

a) $-\frac{9}{20}$ b) $\frac{9}{25}$ c) $\frac{9}{20}$ d) $-\frac{9}{25}$ e) $\frac{7}{25}$

2. 0.915

a) $\frac{181}{200}$ b) $\frac{183}{300}$ c) $\frac{181}{300}$ d) $\frac{183}{200}$ e) $\frac{150}{211}$

3. 4.215

a) $4\frac{43}{200}$ b) $44\frac{7}{200}$ c) $4\frac{47}{200}$ d) $4\frac{49}{200}$ e) $4\frac{39}{200}$

4. Write 47% as a decimal.

a) 4.7 b) 0.47 c) 0.047 d) 0.4 e) 0.0047

5. Write 15% as a fraction.

a) $\frac{15}{20}$ b) $\frac{13}{100}$ c) $\frac{1}{10}$ d) $\frac{3}{20}$ e) $\frac{7}{5}$

6. What number is 36% of 98?

a) 421 b) 3.53 c) 134 d) 272.22 e) 35.28

7. Write the mixed number $4\frac{7}{8}$ as a percent.

a) 4.875% b) 487.5% c) 48.75% d) 490% e) 0.487%

8. What number is 300% of 9?

a) 2700 b) 270 c) 2.7 d) 0.27 e) 27

9. What percent of 45 is 15?

a) $32\frac{1}{3}$ b) 32 c) $33\frac{1}{3}$ d) $31\frac{1}{3}$ e) 31

10. 3 is 16% of what number?

a) 18.75 b) 17 c) 17.75 d) 18 e) 19

11. 90% of 5 is what number?

a) 45 b) 4.5 c) .45 d) 450 e) 0.045

12. 24% of what number is 20.4?

a) 85 b) .85 c) 8.5 d) 850 e) .0085

13. Change $2\frac{5}{7}$ to decimal form and round off to the nearest hundredths.

a) 27.10 b) 2.72 c) 2.714 d) 2.71 e) 27.14

14. $1\frac{1}{2} \div .75$

a) $\frac{9}{8}$ b) 1.33 c) .75 d) -2 e) 2

15. $.5 + \frac{2}{3} \div \frac{2}{5}$

a) 2.91 b) 2.17 c) $2\frac{11}{12}$ d) 2 e) 1.98

16. $4\frac{2}{5} - (3.5)(3\frac{1}{7})$

a) $\frac{11}{5}$ b) $\frac{32}{5}$ c) $\frac{20}{35}$ d) $-\frac{33}{5}$ e) $-\frac{11}{5}$

17. $\frac{3}{2} - 1\frac{2}{3} + .25$

a) $\frac{1}{4}$ b) $\frac{3}{4}$ c) $\frac{1}{12}$ d) $\frac{5}{12}$ e) $\frac{11}{12}$

18. $180 \div 1.2$

a) 150 b) 1.5 c) 0.15 d) 15 e) 0.015

FOR PROBLEMS #19 THROUGH #25, WRITE ANSWERS TO NEAREST <u>TENTH</u>.

19. $0.01 + 3.2 + 0.223 + 5.7$

a) 11.2 b) 0.1 c) 9.2 d) 9.1 e) 91.3

20. $12.0 \div 0.2 - 1.13 + 3.2$

a) 8.0 b) 62.1 c) 602.1 d) 55.7 e) 4.5

21. $(2.18 - 3.15) \div 1.2$

a) 0.8 b) -0.8 c) -0.81 d) .81 e) -0.801

22. $22.3 + 122.45 - 2.3[2.03 - 0.04]$

a) 130 b) 140.1 c) 140.3 d) 140.2 e) 130.2

23. $1.1(2.0) - 1.1 + 22.22$

a) 23.3 b) 43.1 c) 21.2 d) 21.3 e) 23.2

24. $1.5 \div 3.0 + 0.1(2.0 - 0.4)$

a) 0.6 b) 0.72 c) 0.71 d) 0.5 e) 0.7

25. $4.0[0.2 + 0.01]$

a) 0.8 b) 8.4 c) 4.8 d) .48 e) .04

WRITE THE ALGEBRAIC EXPRESSION DESCRIBED BY EACH OF THE WORD PHRASES.

1. The quotient of a number and eight

   a) $\frac{8}{x}$ b) $8x$ c) $x - 8$ d) $\frac{x}{8}$ e) $8 + x$

2. A number decreased by twelve

   a) $\frac{12}{x}$ b) $x - 12$ c) $\frac{x}{12}$ d) $12 - x$ e) $x + 12$

3. Three times the sum of a number and four

   a) $4(x + 3)$ b) $3(4x)$ c) $3x + 4$ d) $3(x - 4)$ e) $3(x + 4)$

4. Five less twice a number

   a) $5 - 2x$ b) $\frac{2x}{5}$ c) $5(2x)$ d) $2x - 5$ e) $\frac{5}{2x}$

EXPRESS EACH UNKNOWN IN TERMS OF THE SAME VARIABLE.

5. If the sum of two numbers is 30 and x = the first number, how would you represent the second number?

   a) it cannot be represented b) $x - 30$ c) $30 - x$ d) $\frac{30}{x}$
   e) $30 + x$

6. George builds model airplanes and sells them to make extra money. The cost for making one plane is \$x and he has fixed costs of \$30 a month. How would you represent his costs in a month that he made 12 planes?

   a) $12x + 30$ b) $12(x + 30)$ c) $12(30) + x$ d) $12x - 30$
   e) it cannot be represented

7. A class contains x students. If two-fifths of the students are women, represent the number of men in the class.

   a) $\frac{2}{5}x$ b) $\frac{3}{5}x$ c) $x - \frac{2}{5}$ d) $x - \frac{3}{5}$ e) $\frac{x}{\frac{2}{5}}$

8. Represent the perimeter of a rectangle if the length is ℓ meters and the width is four meters less than the length.

   a) $\ell(\ell - 4)$ b) $\ell + (\ell - 4)$ c) $2\ell + 2(4 - \ell)$ d) $2\ell + 2(\ell - 4)$
   e) $2\ell[2(\ell - 4)$

9. The first of two numbers is ten more than the other. How would you represent their sum?

   a) $2x + 10$ b) $2(x + 10)$ c) $(x + 10) - x$ d) $x - (10 + x)$
   e) $(x + 10)x$

USE EQUATIONS TO SOLVE THE FOLLOWING WORD PROBLEMS.

10. Three fourths of what number is 12?

a) 9 b) 3 c) 4 d) 16 e) 20

11. If eight is added to $\frac{1}{7}$ of a number, the result is 14. What is this number?

a) 10 b) $\frac{22}{7}$ c) $\frac{6}{7}$ d) 154 e) 42

12. The sum of $\frac{1}{3}$ of a number and $\frac{1}{2}$ of the number is 10. Find the number.

a) 25 b) 16 c) 14 d) 12 e) 2

13. The current value of a business machine is \$100 less than one-half of its cost. If it is worth \$450 today, what was its cost?

a) \$1,000 b) \$1,100 c) \$800 d) \$700 e) \$1,200

14. Pete has \$53 less than Ann and together they have \$97. How much money does Ann have?

a) \$82 b) \$44 c) \$64 d) \$80 e) \$75

15. Five feet more than twice the length of a rectangle is 33. Find the length of the rectangle.

a) 22 b) 19 c) 16 d) 14 e) 28

16. A back-pack was on sale for 20% off the original price. If you paid \$36 for the pack, what was the original price?

a) \$7.20 b) \$43.20 c) \$45.00 d) \$28.80 e) \$180.00

SOLVE FOR THE INDICATED VARIABLE.

17. $A = \frac{1}{2}bh$, for b

a) $\frac{2A}{h}$ b) $\frac{A - h}{2}$ c) $\frac{A}{2h}$ d) $\frac{2h}{A}$ e) $2A - h$

18. $V = \ell wh$, for w

a) $\frac{\ell h}{V}$ b) $V - \ell h$ c) $\frac{V}{\ell h}$ d) $\frac{Vh}{\ell}$ e) $\frac{V\ell}{h}$

19. $P = 2(L + W)$, for W

a) $\frac{P}{2L}$ b) $2P - L$ c) $\frac{2P}{L}$ d) $P - 2L$ e) $\frac{P}{2} - L$

20. $A = \frac{h}{2}(b + a)$, for b

a) $A - \frac{h}{2} - a$ b) $\frac{2A - ha}{h}$ c) $\frac{2A}{h + a}$ d) $A - h + 2a$ e) $a - A + 2h$

21. $a = p + prt$, for r

a) $a - p - pt$ b) $\frac{a - p}{pt}$ c) $\frac{a}{pt} - p$ d) $\frac{a}{p + pt}$ e) $\frac{p - a}{pt}$

22. $ax - b = c$, for x

a) $\frac{b + c}{a}$ b) $\frac{c - b}{a}$ c) $\frac{c}{a} + b$ d) $\frac{c}{a} - b$ e) $\frac{cb}{a}$

23. $\frac{3xy}{z} = 10$, for x

a) $\frac{10y}{3z}$ b) $\frac{3y}{10z}$ c) $\frac{3z}{10y}$ d) $\frac{10z}{3y}$ e) $\frac{10yz}{3}$

24. $3bx + ax = 9$, for x

a) $\frac{9 - ax}{3b}$ b) $9 - (3b + a)$ c) $\frac{9}{3b + a}$ d) $\frac{9}{\frac{3b}{a}}$ e) $\frac{9 - 3bx}{a}$

25. $2x - 3y = 5$, for y

a) $\frac{5 - 2x}{3}$ b) $\frac{2x + 5}{3}$ c) $(5 - 2x) + 3$ d) $(2x - 5) - 3$ e) $\frac{2x - 5}{3}$

SIMPLIFY EACH EXPRESSION SO THAT IT HAS ONLY POSITIVE EXPONENTS. EVALUATE WHEN POSSIBLE.

1. $2^5 \cdot 2^{-8}$

   a) $\frac{1}{2^{40}}$ b) $\frac{1}{2^{13}}$ c) -6 d) $\frac{1}{8}$ e) -8

2. $\frac{(2x^2)(3x^4)}{6x^6}$

   a) 1 b) x^2 c) x^{12} d) x^{-2} e) $3x^0$

3. $\frac{10^8 \cdot 10^2}{(10^0)^2}$

   a) 10^8 b) 10^{16} c) $\frac{10^{10}}{2}$ d) 10^{14} e) 10^{10}

4. $-(x^2)^5$

   a) $-x^7$ b) x^{10} c) $-x^{10}$ d) $-x^{25}$ e) x^7

5. $(x^2y^{-2})^{-1}(x^3y^0)^2$

   a) x^4y^2 b) x^5y^2 c) x^4y^{-2} d) x^3y^2 e) x^4y^3

6. $\frac{5^{-2}a^2b^3}{10^{-1}a^0b^{-2}}$.

   a) $\frac{2a^2b^5}{5}$ b) $\frac{a^2b^5}{5}$ c) $10a^2b^5$ d) $\frac{2ab^5}{5}$ e) $\frac{2}{5}a^3b^4$

7. $\left(\frac{3^{-1}x^{-1}y^3}{x^2y^{-1}}\right)^2$

   a) $\frac{y^4}{9x^2}$ b) $\frac{y^8}{9x^6}$ c) $\frac{-6y^8}{x^6}$ d) $\frac{9y^8}{x^6}$ e) $\frac{-9y^4}{x^2}$

8. Express in scientific notation: 0.00078

   a) 7.8×10^4 b) 7.8×10^3 c) 7.8×10^{-3} d) 7.8×10^{-4}
   e) 7.8×10^{-5}

EXPRESS IN DECIMAL NOTATION.

9. 1.01×10^6

   a) 101000 b) 0.000101 c) 0.00000101 d) 1010000 e) 101000000

10. 6.87×10^{-3}

    a) 687 b) 6870 c) 0.000687 d) 0.687 e) 0.00687

PERFORM THE INDICATED OPERATIONS AND EXPRESS IN SCIENTIFIC NOTATION.

11. $\dfrac{2.6 \times 10^{12}}{1.3 \times 10^{10}}$

a) 2×10^{2} b) 2×10^{-2} c) 20×10^{1} d) 2.2×10^{2} e) 20×10^{2}

12. $(630{,}000)(0.03)$

a) 1.89×10^{4} b) 1.89×10^{-2} c) 18.9×10^{3} d) 1.89×10^{2}
e) 1.89×10^{3}

13. $\dfrac{36{,}000}{.0009}$

a) $.4$ b) 4×10^{-1} c) $.4 \times 10^{0}$ d) $.4 \times 10^{8}$ e) 4×10^{7}

14. Combine like terms and arrange in descending powers of x:
$x - 3x^3 + 2x^2 - 5x - 4x^2 + x^3 + 7$

a) $7 - 8x^3$ b) $-4x - 2x^3 - 2x^2 + 7$ c) $7 - 5x - 2x^2 - 2x^3$
d) $-8x^3 + 7$ e) $-2x^3 - 2x^2 - 4x + 7$

15. Simplify: $(2x^3 - 4) + (4x^2 + 8x) - (9x - 7)$

a) $2x^3 + 4x^2 - x + 3$ b) $2x^3 + 3x^2 - 11$ c) $2x^3 + 3x^2 + 3$
d) $2x^3 + 4x^2 - x - 11$ e) $2x^3 + 4x^2 - 17x - 11$

16. Subtract $(2x^2 - 4x + 3)$ from $(5x^2 - 2x + 1)$

a) $3x^2 + 2x - 2$ b) $-3x^2 - 2x + 2$ c) $7x^2 - 6x + 4$
d) $3x^2 - 6x + 4$ e) $7x^2 + 6x + 4$

17. Remove the symbols of grouping and simplify: $2(3x - 2y) - [4x - 2(2x - 3y)]$

a) $6x - 12y$ b) $6x - 8y$ c) $6x - 10y$ d) $-2x - 10y$ e) $-2x - 2y$

FIND THE PRODUCT AND SIMPLIFY, IF POSSIBLE.

18. $(-3x^2y + xy^2 - 4y^3)(-2xy)$

a) $-6x^3y^2 - 2x^2y^3 - 8xy^4$ b) $6x^3y^2 + 2xy^3 + 8xy^3$ c) $-6x^3y^2 - 2xy^3 + 8y^4$
d) $6x^3y^2 - 2x^2y^3 + 8xy^4$ e) $6x^3y^2 - 2x^2y^3 - 8x^2y^3$

19. $(5x + 2)(3x - 4)$

a) $15x^2 - 26x - 8$ b) $15x^2 + 14x - 8$ c) $15x^2 + 26x + 8$
d) $15x^2 - 23x - 12$ e) $15x^2 - 14x - 8$

20. $(y \quad 7)(y^2 + 7y + 49)$

a) $y^3 - 343$ b) $y^3 + 343$ c) $y^3 + 14y^2 - 343$ d) $y^3 + 98y - 343$
e) $y^3 - 14y^2 - 343$

21. $(3x^2 - 4xy + y^2)(4x + 3y)$

a) $12x^3 + 3y^2$ b) $12x^3 - 3y^3$ c) $12x^3 - 7x^2y - 8xy^2 + 3y^3$
d) $12x^3 - 7x^2y + 3y^3$ e) $12x^3 - 7x^2y - 3y^2$

22. $-2(y - b)(y + b)$

a) $4y^2 - b^2$ b) $-2y^2 - 2b^2$ c) $-2y^2 + 4yb + 2b^2$ d) $2b^2 - 2y^2$
e) $4b^2 - 4y^2$

23. $(3ab - 2)^2$

a) $9a^2b^2 + 4$ b) $9a^2b^2 - 6ab + 4$ c) $9a^2b^2 - 12ab + 4$ d) $9a^2b^2 - 4$
e) $9a^2b^2 - 12ab - 4$

24. $(3x - 4y)(3x + 4y)$

a) $9x^2 + 16y^2$ b) $9x^2 - 16y^2$ c) $9x^2 + 24xy - 16y^2$
d) $9x^2 + 12xy - 16y^2$ e) $9x^2 - 24xy - 16y^2$

25. $(3 + x^3)^2$

a) $9 + x^6$ b) $9 + 6x^3 + x^6$ c) $9 + x^5$ d) $9 + 3x^3 + x^6$
e) $9 + 6x^3 + x^5$

DIVIDE.

1. $\dfrac{4x^3 - 7x^2 + 6x}{-2x}$

a) $2x^2 - 5x + 4$ b) $-2x^2 + \frac{7}{2}x - 3x$ c) $-2x^2 + 7x - 3$

d) $-2x^2 + \frac{7}{2}x - 3$ e) $-2x^2 + 7x - 3x$

2. $\dfrac{13x^3y^2 - 26x^2y^3 - 39x^2y^2}{13x^2y^2}$

a) $x - 2y + 3$ b) $x - 26x^2y^3 - 39x^2y^2$ c) $x - 2x^2y^3 - 3x^2y^2$

d) $x - 2y - 3$ e) $13x^3y^2 - 26x^2y^3 - 3$

3. $(x^2 - 4x - 45) \div (x + 5)$

a) $x + 1$, R -40 b) $x + 9$ c) $x - 9$ d) $x + 1$, R -50

e) $x - 9$, R -90

4. $(4x^3 - 10x^2 - 11x + 16) \div (x - 4)$

a) $4x^2 - 10x^2 - 11x - 4$ b) $4x^2 - 26x - 115x$, R 460

c) $4x^2 + 6x - 35$, R 140 d) $4x^2 + 6x + 13$, R -36

e) $4x^2 + 6x + 13$, R 68

5. $(2x^3 + 7x^2 - 4) \div (x - 4)$

a) $2x^2 + 15x + 60$, R 236 b) $2x^2 + 7x^2 + 1$ c) $2x^2 + 15x + 60$, R -244

d) $2x^2 - x - 4$, R -16 e) $2x^2 - x + 4$, R 16

6. $(x^3 + 8) \div (x + 2)$

a) $x^2 + 4$ b) $x^2 - 2x + 4$ c) $x^2 + 2x - 4$ d) $x^2 - 2x + 4$, R 16

e) $x^2 - 2x - 4$

7. $(3x^3 + 7x^2 - 5) \div (x^2 - 2)$

a) $3x + 1$, R -3 b) $3x + 7x^2 + \frac{5}{2}$ c) $3x + 7$, R $-6x + 9$

d) $3x + 7$, R $20x - 5$ e) $3x + 7$, R $6x + 9$

FACTOR COMPLETELY.

8. $-5a^2b^2 - 10a^3b^3 + 5a^4b^4$

a) $5ab(ab - 2a^2b^2 + 5a^3b^3)$ b) $5a^2b^2(-2ab + a^2b^2)$

c) $5a^2b^2(1 - 2ab + a^2b^2)$ d) $5a^2b^2(-1 - 2ab + a^2b^2)$ e) none of these

9. $4c^2 - 12cb + 9b^2$

a) $(2c + 3b)(2c - 3b)$ b) $(2c - 3b)^2$ c) $(2c + 3b)^2$

d) $(4c - 3b)(c - 3b)$ e) $(2c - 9b)(2c + b)$

10. $64 - y^2$

a) $(8 + y)(8 - y)$ b) $(8 + y)^2$ c) $(8 - y)^2$ d) $(16 + y)(4 - y)$
e) $2(32 - y)$

11. $4y^2 - 16y + 7$

a) $(4y - 1)(y - 7)$ b) $(4y - 7)(y - 1)$ c) $(2y - 7)(2y - 1)$
d) $(2y + 7)(2y - 1)$ e) $(4y - 7)(y + 1)$

12. $4x + 12 + xy + 3y$

a) $(y - 4)(x + 3)$ b) $(y + 4)(x - 3)$ c) $(-y + 4)(-x + 3)$
d) $(y + 4)(x + 3)$ e) $(y - 4)(-x + 3)$

13. $2x^2 - 6x + 4$

a) $2(2x - 1)(x + 2)$ b) $2(2x + 1)(x - 2)$ c) $2(x - 2)(x - 1)$
d) $2(x + 2)(x + 1)$ e) $2(x + 2)(x - 1)$

14. $4x^2y - 9y^3$

a) $y(4x^2 - 9y^2)$ b) $(2xy - 3y^2)(2x + 3y)$ c) $y(2x + 3y)^2$
d) $y(2x - 3y)^2$ e) $y(2x - 3y)(2x + 3y)$

15. $9x^2 - 24xy + 16y^2$

a) $(3x + 4y)(3x - 4y)$ b) $(3x + 4y)^2$ c) $(x + 4y)(9x - 4y)$
d) $(3x - 4y)^2$ e) $(9x + y)(x - 16y)$

16. $ax - ay + 2cx - 2cy$

a) $(a - 2c)(x - y)$ b) $(a + 2c)(x + y)$ c) $(a - 2y)(x + y)$
d) $(a + 2c)(x - y)$ e) $(-a + 2c)(-x + y)$

17. $p^2 - \frac{9}{25}q^2$

a) $(p - \frac{3}{5}q)^2$ b) $(p + \frac{3}{5}q)^2$ c) $(p - \frac{3}{5}q)(p + \frac{3}{5}q)$
d) $(p - \frac{9}{25}q)(p + q)$ e) $(p + \frac{9}{25}q)(p - q)$

FACTOR COMPLETELY. ONE FACTOR WILL BE:

18. $3x^2 - 6x - 24$

a) $x + 4$ b) $x - 2$ c) $x - 4$ d) $x - 8$ e) $x + 1$

19. $2ax^2 - 2ax$

a) $2a$ b) $2x$ c) 2 d) $2ax$ e) x

20. $5x^2 + 13x - 6$

a) $5x - 2$ b) $5x + 2$ c) $x - 3$ d) $5x - 6$ e) $x + 1$

SOLVE THE EQUATION.

21. $x^2 + 2x - 48 = 0$

a) $x = 8, x = -6$ b) $x = 8, x = 6$ c) $x = -8, x = 6$
d) $x = -8, x = -6$ e) none of these

22. $x^2 - 5x = 36$

a) $x = -9, x = 4$ b) $x = 6, x = -6$ c) $x = 9, x = 4$
d) $x = 12, x = -3$ e) $x = 9, x = -4$

23. $3z^2 = 75$

a) $z = 5$ b) $z = -5$ c) $z = 5$, double root d) $z = 5, z = -5$
e) $z = -5$, double root

24. Solve $3x^2 - 9x = 0$. The larger of the two solutions is:

a) 0 b) 3 c) -3 d) 9 e) -9

25. Solve $x^2 + 5x = -6$. The smaller of the two solutions is:

a) -3 b) 3 c) -2 d) 2 e) -6

SIMPLIFY EACH EXPRESSION.

1. $\dfrac{x^3 + 3x^2}{2x^2 + 6x}$

a) $\dfrac{x(x + 3)}{2}$ b) $\dfrac{x}{2}$ c) $\dfrac{x^2 + 3x}{2}$ d) $\dfrac{x^2}{2x}$ e) none of these

2. $\dfrac{x^2 - 9}{x^2 + 6x + 9}$

a) $\dfrac{-1}{6x}$ b) -1 c) $\dfrac{x - 3}{x + 3}$ d) $\dfrac{-3}{2x + 3}$ e) $\dfrac{x}{x + 6}$

3. $\dfrac{m^2 - 4m}{16 - m^2}$

a) $\dfrac{m(m - 4)}{(4 - m)(4 + m)}$ b) $-\dfrac{m}{4}$ c) $\dfrac{-m}{4 + m}$ d) $\dfrac{m}{4 + m}$ e) $\dfrac{m}{4 - m}$

PERFORM THE INDICATED OPERATIONS. EXPRESS RESULTS IN SIMPLEST FORM.

4. $\dfrac{x^2 - 2x - 35}{3x^2 + 15x} \div \dfrac{4x - 28}{9x^3}$

a) $\dfrac{3x^2}{4}$ b) $\dfrac{3x^2}{2}$ c) $\dfrac{3x^2(x + 7)(x - 5)}{4(x + 5)(x - 7)}$ d) $\dfrac{3x^3(x + 5)}{4(x^2 + 5x)}$ e) $\dfrac{x^2(-x - 7)}{2(x - 14)}$

5. $\dfrac{(x + 3)^2}{64yz} \cdot \dfrac{40y^2z}{x^2 - 9}$

a) $\dfrac{5y}{8(x - 3)}$ b) $\dfrac{5y}{8}$ c) $\dfrac{5(x + 3)}{8(x - 3)}$ d) $\dfrac{5}{8}$ e) $\dfrac{5y(x + 3)}{8(x - 3)}$

6. $\dfrac{x + y}{3y} \cdot \dfrac{6y^2 - 3y}{x^2 - y^2}$

a) $\dfrac{x - y}{2y - 1}$ b) $\dfrac{(x + y)(2y - 1)}{x^2 - y^2}$ c) $\dfrac{x^2 - y^2}{(x + y)(2y - 1)}$ d) $\dfrac{2y - 1}{x - y}$

e) $\dfrac{2y^2 - y}{y(x - y)}$

7. $\dfrac{25x^2 - 1}{10x^2 + 17x + 3} \div 1 - 5x$

a) $\dfrac{-1}{2x + 3}$ b) $\dfrac{-(5x + 1)}{(2x + 1)(5x + 3)}$ c) $\dfrac{-(5x + 1)}{(10x + 3)(x + 1)}$ d) $\dfrac{1}{2x + 3}$

e) $\dfrac{5x + 1}{(x + 1)(10x + 3)}$

8. $\left[\frac{x-2}{x^2-3x} \cdot \frac{x^2+x-12}{x^2-x-2}\right] \div \frac{x+4}{x}$

a) $\frac{(x-2)}{(x+2)(x-1)}$ b) $\frac{1}{x+1}$ c) $\frac{(x+4)^2}{x^2(x+1)}$ d) $\frac{(x-4)(x+3)}{(x-3)(x+1)(x+4)}$

e) $\frac{x}{x+1}$

FIND THE LEAST COMMON DENOMINATOR.

9. $\frac{3}{x} + \frac{2}{x^2} - \frac{1}{3x}$

a) x^3 b) $3x^3$ c) $3x^2$ d) $3x^4$ e) x^4

10. $\frac{1}{t} + \frac{1}{t^2-5t} - \frac{1}{t^2-25}$

a) t^2-5t b) t^2-25 c) $t(t^2-5t)(t^2-25)$ d) $t(t^2-25)$

e) $t(t^2-5t)$

FIND "?" SO THAT THE FRACTIONS WILL BE EQUAL.

11. $x = \frac{?}{x+2}$

a) $x+(x+2)$ b) $x+2$ c) x d) x^2+2 e) $x(x+2)$

12. $\frac{y}{y+4} = \frac{?}{y^2-16}$

a) $y(y-4)$ b) $y-4$ c) y d) $y(y+4)$ e) $y(y-4)(y+4)$

PERFORM THE INDICATED OPERATIONS. EXPRESS RESULTS IN SIMPLEST FORM.

13. $\frac{x+y}{x-6} - \frac{5x-2y}{x-6}$

a) $\frac{4y-3x}{x-6}$ b) $-\frac{4x-y}{x-6}$ c) $\frac{6x-y}{x-6}$ d) $\frac{6x+3y}{x-6}$ e) $\frac{3y-4x}{x-6}$

14. $\frac{3x}{x-y} + \frac{2}{y-x}$

a) $\frac{3x+2}{x^2-y^2}$ b) $\frac{6x}{x-y}$ c) $\frac{3x-2}{x-y}$ d) $\frac{3x+2}{x+y}$ e) $\frac{3xy-3x^2+2x-2y}{(x-y)(y-x)}$

15. $\frac{a-b}{ab} - \frac{a-c}{ac} + \frac{b-c}{bc}$

a) 1 b) $\frac{1}{abc}$ c) $-\frac{2}{a}$ d) $\frac{a-b}{abc}$ e) 0

16. $\frac{x}{x+2} + \frac{4(2x-1)}{x^2-4} - \frac{3}{x-2}$

a) $\frac{x+5}{x+2}$ b) $\frac{9x-7}{x^2-4}$ c) $\frac{x^2+3x-10}{x^2-4}$ d) $\frac{9x-7}{(x^2-4)(x+2)(x-4)}$

e) $\frac{x+1}{x-2}$

SIMPLIFY.

17. $\dfrac{\frac{3}{5} + 2}{2 - \frac{3}{4}}$

a) $\frac{5}{-4}$ b) $-\frac{4}{5}$ c) $\frac{13}{4}$ d) $\frac{52}{25}$ e) $\frac{17}{10}$

18. $\dfrac{\frac{a - 4}{3}}{\frac{8 - 2a}{9}}$

a) $\frac{3}{-2}$ b) $\frac{3}{2}$ c) $\frac{(a - 4)(8 - 2a)}{3}$ d) $\frac{3(a - 4)}{8 - 2a}$ e) $\frac{(a - 4)(8 - 2a)}{27}$

19. $\dfrac{\frac{1}{x} + \frac{1}{y}}{\frac{x^2 - y^2}{xy}}$

a) $-\frac{1}{xy}$ b) $\frac{1}{y - x}$ c) $\frac{1}{x - y}$ d) $\frac{y + x}{xy(x - y)}$ e) $\frac{(y + x)(x^2 - y^2)}{(xy)^2}$

20. $\dfrac{\frac{a^2 + 2ad + d^2}{a^3d^3}}{\frac{a + d}{2ad^2}}$

a) $\frac{2ad^2}{a + d}$ b) $\frac{2(a + d)}{a^2d}$ c) $\frac{a^2 + 2ad + d^2}{a^3d^3} \cdot \frac{2ad^2}{a + d}$ d) $\frac{a + d}{a^2d}$

e) $\frac{2(a^2 + 2ad + d^2)}{a^2d(a + d)}$

SOLVE EACH EQUATION.

21. $\frac{1}{3} + \frac{1}{x} = \frac{1}{2}$

a) 6 b) 3 c) 4 d) 2 e) -6

22. $\frac{7}{3y - 1} = \frac{1}{y - 3}$

a) $\frac{1}{5}$ b) 2 c) $\frac{1}{2}$ d) 5 e) no solution

23. $\frac{y - 2}{10y} - \frac{y + 1}{15y} = \frac{1}{6}$

a) 2 b) -2 c) 4 d) -4 e) none of these

24. $\frac{2}{x - 3} - \frac{2}{x} = \frac{19}{x^2 - 3x}$

a) 3 b) 4 c) 2 d) 5 e) no solution

25. $1 - \frac{5}{x} = -\frac{6}{x^2}$

a) 3 b) -1 or 6 c) 2 or 3 d) $\frac{7}{5}$ e) 2

1. Determine $f(-1)$ when $f(x) = x^2 - x - 1$.

   a) -9 b) 1 c) -1½ d) -1 e) 9

2. Given the function g described by $g(x) = x^3 - 2x$, find $g(-2)$.

   a) -12 b) 12 c) 4 d) -4 e) -2

3. Write the equation for the line passing through the point (2,-4) with slope $m = -3$.

   a) $y + 3x = -10$ b) $y - 3x = -2$ c) $x + 3y = -2$ d) $x - 3y = 10$
   e) $y + 3x = 2$

WRITE AN EQUATION FOR THE LINE PASSING THROUGH THE GIVEN POINTS.

4. (2,-7), (3,5)

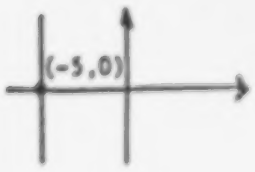
   a) $2x - y = 11$ b) $12x + y = 17$ c) $y - 12x = -31$ d) $2x - y = 17$
   e) $y - 2x = 11$

5. (1,-4), (-2,5)

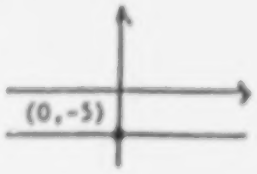
   a) $3x - y = 1$ b) $3x + y = 1$ c) $3x - y = -13$ d) $3x + y = 1$
   e) $3x + y = -1$

6. Which of the following is a graph of $y = -5x$?

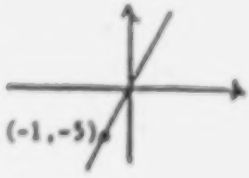
   a)



   b)

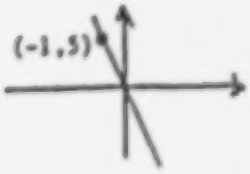


   c)



   d)

   e)



DETERMINE THE SLOPE AND Y-INTERCEPT:

7. $y = 1 - \frac{x}{2}$

   a) $m = -\frac{1}{2}$, $b = 1$ b) $m = -2$, $b = 1$ c) $m = 1$, $b = -\frac{1}{2}$
   d) $m = -\frac{1}{2}$, $b = 2$ e) $m = \frac{1}{2}$, $b = 1$

8. $12x - 3y = 9$

a) $m = 12, b = -9$ b) $m = 4, b = -9$ c) $m = 12, b = -3$

d) $m = 4, b = -3$ e) $m = -4, b = 3$

9. $y = -2$

a) $m = 0, b = 2$ b) $m = 2, b = 0$ c) $m = 0, b = -2$

d) $m =$ undefined, $b = 2$ e) $m = 5$, b does not exist

10. $2x + 5y = 9$

a) $m = -\frac{5}{2}, b = \frac{9}{2}$ b) $m = \frac{5}{2}, b = \frac{9}{2}$ c) $m = \frac{2}{5}, b = \frac{9}{5}$

d) $m = -\frac{2}{5}, b = \frac{9}{5}$ e) $m = -\frac{2}{5}, b = -\frac{9}{5}$

FOR EACH OF THE SIX GRAPHS, DETERMINE THE SLOPE AND Y-INTERCEPT.

11. Graph A

a) $m = -8, b = -1$ b) $m = -1, b = 8$ c) $m = 1, b = 8$

d) $m = -2, b = 8$ e) $m = -8, b = 8$

12. Graph B

a) $m = 0, b = 8$ b) $m = 2, b = 5$ c) $m = 1, b = 10$

d) $m = 10, b = 0$ e) $m = 0, b = 10$

13. Graph C

a) $m = \frac{2}{3}, b = 0$ b) $m = \frac{3}{2}, b = 0$ c) $m = -\frac{6}{4}, b = 0$

d) $m = -\frac{2}{3}, b = 0$ e) $m = \frac{4}{6}, b = 1$

14. Graph D

a) $m = 0, b = -6.5$ b) $m = 0, b = -7$ c) $m = 1, b = -7$

d) $m = 1, b = 7$ e) $m =$ undefined, b does not exist

15. Graph E

a) $m = -\frac{8}{6}, b = 6$ b) $m = \frac{4}{3}, b = 6$ c) $m = 4, b = 6$

d) $m = -\frac{3}{4}, b = 6$ e) $m = \frac{6}{8}, b = 6$

16. Graph F

a) $m = -\frac{1}{2}, b = -12$ b) $m = -2, b = -12$ c) $m = 2, b = -12$

d) $m = \frac{1}{2}, b = -12$ e) $m = -\frac{1}{2}, b = 12$

FOR EACH OF THE SIX GRAPHS, WHICH IS THE EQUIVALENT EQUATION?

17. Graph A

a) $y = x - 8$ b) $y = x + 8$ c) $y = -x - 8$ d) $y = -x + 8$
e) $y = 2x + 8$

18. Graph B

a) $y = x + 10$ b) $y = -x + 10$ c) $x = 10$ d) $y = 10$ e) $y = -10$

19. Graph C

a) $y = \frac{2}{3}x + \frac{1}{3}$ b) $y = \frac{2}{3}x$ c) $y = \frac{3}{2}x$ d) $y = -\frac{2}{3}x$ e) $y = -\frac{3}{2}x$

20. Graph D

a) $y = -7$ b) $y = 7$ c) $x = 7$ d) $x = -7$ e) $y = -x + 7$

21. Graph E

a) $y = -\frac{3}{4}x + 6$ b) $y = -\frac{3}{4}x - 6$ c) $y = \frac{3}{4}x + 6$ d) $y = \frac{4}{3}x - 8$
e) $y = -\frac{3}{4}x - \frac{3}{2}$

22. Graph F

a) $y = -2x - 12$ b) $y = 2x + 12$ c) $y = -2x + 12$ d) $y = -\frac{1}{2}x + 6$
e) $y = -\frac{1}{2}x - 6$

23. Which graph is parallel to the x-axis?

a) B b) A c) D d) E e) F

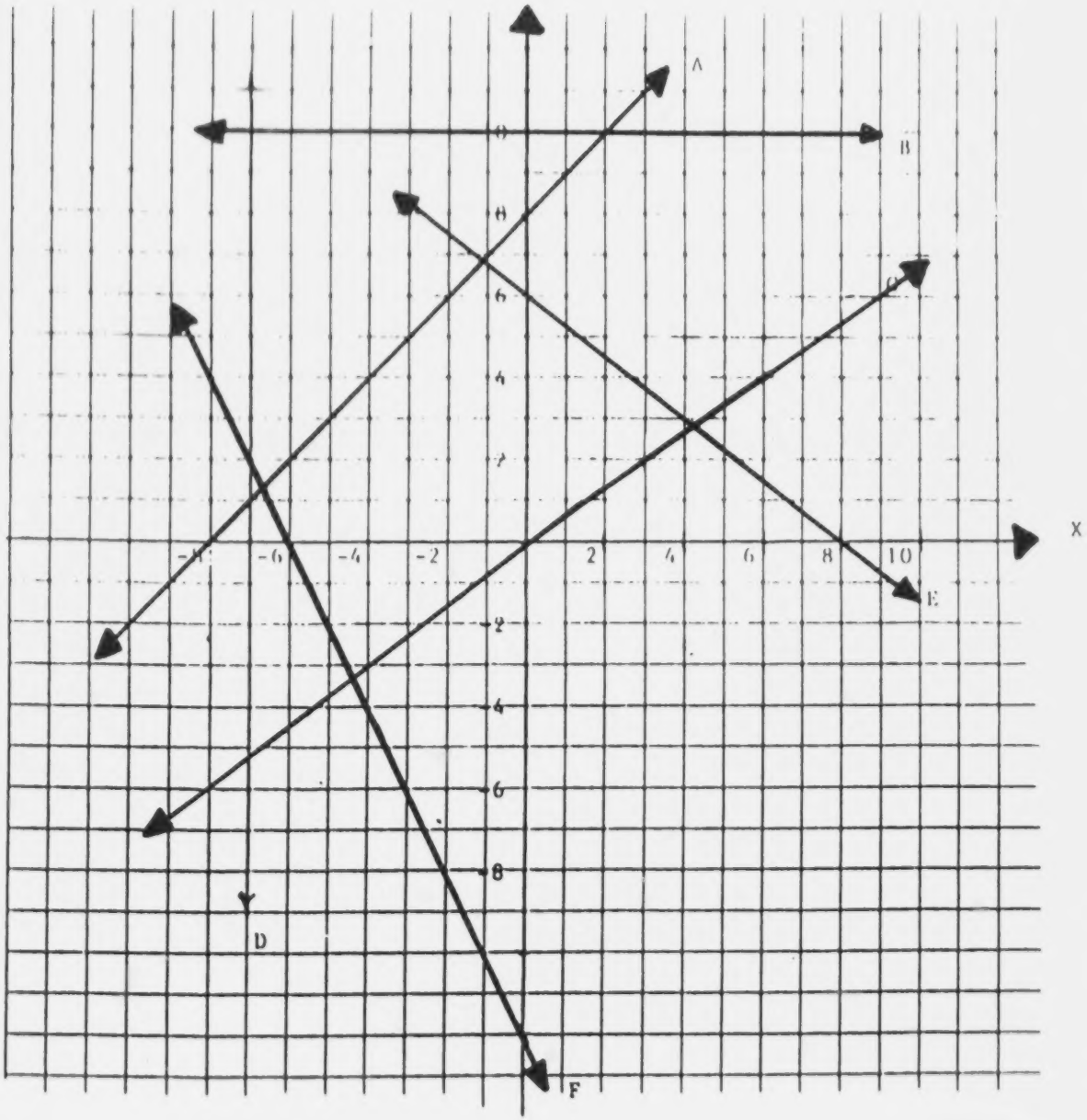
24. Which graph crosses the (0,0) point?

a) A b) B c) C d) D e) E

25. Which graph intercepts the y-axis at 8?

a) E b) B c) D d) C e) A

MATH 3014 - MODULE 9 (CONTINUED)
QUESTIONS #11 THROUGH #25



USING GRAPH PAPER, SOLVE EACH SYSTEM GRAPHICALLY. SUBMIT YOUR GRAPHS WITH COMPLETED SCANTRON FORM.

1. $2x - y = 4$
   $3x + 2y = 6$

   a) $(-2,6)$ b) $(3,2)$ c) $(0,2)$ d) $(-1,-6)$ e) $(2,0)$

2. $2x + 3y = 8$
   $x - 2y = -3$

   a) $(4,0)$ b) $(-1,1)$ c) $(1,2)$ d) $(\frac{5}{2},1)$ e) $(0,\frac{3}{2})$

3. $y = -2x + 1$
   $4x + y = 5$

   a) $(-3,2)$ b) $(-2,-3)$ c) $(-3,-2)$ d) $(2,-3)$ e) $(1,-1)$

4. $2x - y = -9$
   $y - x = 8$

   a) $(-1,7)$ b) $(0,8)$ c) $(1,9)$ d) $(-1,9)$ e) $(-2,6)$

USE THE SUBSTITUTION METHOD TO FIND THE SIMULTANEOUS SOLUTION FOR THE FOLLOWING SYSTEMS.

5. $2x + 3y = -8$
   $y = 3x + 12$

   a) $(-\frac{20}{11},\frac{72}{11})$ b) $(-\frac{1}{4},\frac{45}{4})$ c) $(\frac{28}{11},\frac{216}{11})$ d) $(-4,0)$ e) $(0,-4)$

6. $3x + y = -1$
   $6x - 2y = 10$

   a) $(-\frac{11}{6},-\frac{32}{2})$ b) $(\frac{2}{3},-3)$ c) $(2,1)$ d) $(-2,5)$ e) $(\frac{2}{3},3)$

7. $x - 3y = 3$
   $3x + 2y = -13$

   a) $(\frac{3}{2},-\frac{1}{2})$ b) $(-\frac{33}{7},\frac{4}{7})$ c) $(-3,2)$ d) $(-\frac{3}{2},-\frac{3}{2})$ e) $(-3,-2)$

8. $x + 4y = -8$
   $2x - 8y = 16$

   a) $(-2,0)$ b) $(0,-2)$ c) $(-4,-1)$ d) $(8,0)$ e) $(4,1)$

9. $x - 3y = 1$
   $3x - 6y = 4$

   a) $(2,\frac{1}{3})$ b) $(0,-\frac{1}{3})$ c) $(\frac{4}{5},-\frac{1}{15})$ d) $(-2,-1)$ e) $(5,2)$

10. $3x + y = -4$
    $6x + 7y = 2$

    a) $(3,4)$ b) $(6,-2)$ c) $(-2,2)$ d) $(-6,2)$ e) $(-3,4)$

11. $3x + y = 3$
$x - 3y = -9$

a) (1,1) b) (0,3) c) (1,3) d) (0,-3) e) (0,0)

12. $x + y = 4$
$2x + 7y = -2$

a) (3,4) b) (6,2) c) (6,-2) d) (-3,4) e) (2,6)

13. $2x + y = 0$
$7x + 6y = -10$

a) (2,-4) b) (-2,4) c) (3,1) d) (1,3) e) (-1,3)

14. $2x + 3y = 0$
$y - 2x = 0$

a) (0,0) b) (1,1) c) (2,2) d) (3,3) e) (1,4)

USE THE ADDITION METHOD TO FIND THE SOLUTION FOR THE FOLLOWING SYSTEMS.

15. $2x - y = 8$
$x + 3y = 4$

a) $(\frac{12}{5}, -\frac{16}{5})$ b) (3,-2) c) (4,0) d) (-2,2) e) (1,-6)

16. $2x + 3y = 6$
$3x - y = -13$

a) (9,-4) b) $(-\frac{7}{11}, \frac{80}{33})$ c) (-3,4) d) (-2,7) e) (6,-2)

17. $-4x + 2y = -8$
$8x - y = 4$

a) (-1,-6) b) (0,-4) c) (-2,-8) d) (-1,4) e) (3,2)

18. $2x + 5y = 11$
$3x + 8y = 18$

a) (-2,3) b) (0,2) c) (3,1) d) (-7,5) e) (8,-1)

19. $5x = 8 + 2y$
$8y = 16 + 10x$

a) (-2,-9) b) (2,1) c) (-4,-14) d) $(-\frac{24}{5}, 8)$ e) $(\frac{24}{5}, 8)$

20. $5x + 2y = 3$
$-2x + 3y = 14$

a) (3,-6) b) (1,-1) c) (-3,9) d) (-1,4) e) (1,4)

21. $2x + y = 7$
$2x - y = 1$

a) $(-3,2)$ b) $(2,3)$ c) $(3,-2)$ d) $(3,2)$ e) $(-2,3)$

22. $x + 3y = 7$
$5x - 2y = 1$

a) $(-1,2)$ b) $(1,-2)$ c) $(-2,1)$ d) $(2,1)$ e) $(1,2)$

23. $2x - 5y = 1$
$4x + 6y = -14$

Solve the system of equations for x and y. Then, find $2x - y$.

24. $2x + 6y = 14$
$10x - 4y = 2$

a) -1 b) 0 c) 3 d) 4 e) -3

25. $2x - \frac{5}{2}y = -\frac{1}{2}$

$3x - 2y = 1$

a) 2 b) -1 c) 1 d) 0 e) -2

SIMPLIFY.

1. $-\sqrt{\frac{9}{64}}$

a) $-\frac{3}{8}$ b) $\frac{3}{8}$ c) $-\frac{3}{64}$ d) $\frac{9}{8}$ e) $\frac{9}{-8}$

2. $\sqrt{.0169}$

a) 0.0013 b) 0.013 c) 0.13 d) 0.0043 e) 1.30

3. $\sqrt{192}$

a) $4\sqrt{12}$ b) $8\sqrt{3}$ c) $2\sqrt{48}$ d) $6\sqrt{3}$ e) $3\sqrt{64}$

SIMPLIFY EACH EXPRESSION.

4. $\frac{\sqrt{125}}{\sqrt{10}}$

a) 12.5 b) $\frac{5\sqrt{5}}{\sqrt{10}}$ c) $5\sqrt{2}$ d) $\frac{5\sqrt{2}}{2}$ e) $\frac{5}{2}$

5. $\frac{\sqrt{12}}{\sqrt{3}}$

a) 2 b) 4 c) 3 d) 1 e) 0

6. $\sqrt{\frac{125}{100}}$

a) $\sqrt{5}$ b) $2\sqrt{5}$ c) $\frac{\sqrt{5}}{2}$ d) $5\sqrt{2}$ e) $\frac{\sqrt{2}}{5}$

PERFORM THE OPERATIONS. SIMPLIFY.

7. $\sqrt{8} - \sqrt{5} - \sqrt{20}$

a) $-\sqrt{17}$ b) $-\sqrt{5}$ c) $\sqrt{2} - 2\sqrt{5}$ d) $4\sqrt{2} - 5\sqrt{5}$ e) $2\sqrt{2} - 3\sqrt{5}$

8. $\sqrt{50} - \sqrt{32} + \sqrt{18}$

a) $2\sqrt{4}$ b) $2\sqrt{18}$ c) $4\sqrt{2}$ d) 6 e) 4

9. $\sqrt{24} + \sqrt{54} - \sqrt{180}$

a) $-\sqrt{102}$ b) $5\sqrt{6} - 6\sqrt{5}$ c) $13\sqrt{6} - 36\sqrt{5}$ d) $13\sqrt{6} - 6\sqrt{5}$
e) $5\sqrt{6} - 36\sqrt{5}$

10. $\sqrt{6}(\sqrt{3} - \sqrt{2})$

a) $\sqrt{6}$ b) $2\sqrt{2}$ c) $3\sqrt{2} - 2\sqrt{3}$ d) $2\sqrt{3} - 3\sqrt{2}$ e) $\sqrt{5}$

11. $\sqrt{3a}(\sqrt{12a} - \sqrt{27a})$

a) $-\sqrt{45a^2}$ b) $-3a\sqrt{5}$ c) -3 d) $-3a$ e) $-3\sqrt{a}$

12. $(\sqrt{2} - 1)(\sqrt{2} + 5)$

a) $-1 + 4\sqrt{2}$ b) $-5 + 4\sqrt{2}$ c) $\sqrt{2}$ d) $7 + 4\sqrt{2}$ e) $-3 + 4\sqrt{2}$

13. $(\sqrt{5} - \sqrt{3})(3\sqrt{5} - \sqrt{3})$

a) $18 - 8\sqrt{15}$ b) $18 - 4\sqrt{15}$ c) $3\sqrt{5} - 4\sqrt{15} + \sqrt{3}$ d) 4
e) $18 - 2\sqrt{15}$

14. $(\sqrt{x} - 3)(\sqrt{x} + 3)$

a) $x - 9$ b) $x - 3$ c) $\sqrt{x} - 9$ d) $x - 6\sqrt{x} - 9$ e) $\sqrt{2x} - 9$

15. $(2\sqrt{3} + 4)(2\sqrt{3} - 3)$

a) $6(\sqrt{3} - 2)$ b) $24 + 2\sqrt{3}$ c) $12 + 2\sqrt{3}$ d) $2\sqrt{3}$ e) $-2\sqrt{3}$

16. $(\sqrt{3} - 4)^2$

a) 19 b) $19 + 8\sqrt{3}$ c) -7 d) -13 e) $19 - 8\sqrt{3}$

17. $(2\sqrt{6} + 3)(2\sqrt{6} - 3)$

a) $4\sqrt{6} - 9$ b) 9 c) 15 d) 3 e) $12\sqrt{6} - 9$

RATIONALIZE THE DENOMINATOR. SIMPLIFY.

18. $\dfrac{20}{\sqrt{2}}$

a) 10 b) $\sqrt{10}$ c) $5\sqrt{2}$ d) $10\sqrt{2}$ e) $\sqrt{18}$

19. $\dfrac{\sqrt{x} + 1}{\sqrt{x}}$

a) 1 b) $\sqrt{x}$ c) $\dfrac{x + \sqrt{x}}{x}$ d) $1 + \sqrt{x}$ e) 2

20. $\dfrac{\sqrt{5}}{\sqrt{5} + 2}$

a) $5 - 2\sqrt{5}$ b) $-\sqrt{5}$ c) $\dfrac{1}{3}$ d) $\dfrac{5 - 2\sqrt{5}}{3}$ e) $\dfrac{5 - 2\sqrt{5}}{21}$

21. $\dfrac{\sqrt{7} + \sqrt{5}}{\sqrt{7} - \sqrt{5}}$

a) $6 + 2\sqrt{35}$ b) 6 c) $\sqrt{6}$ d) $6 + \sqrt{35}$ e) $12 + \sqrt{35}$

22. $\dfrac{4\sqrt{5}}{3 - \sqrt{5}}$

a) $\dfrac{4}{3}$ b) $3\sqrt{5} + 20$ c) $12\sqrt{5} + 5$ d) $-6\sqrt{5} - 10$ e) $3\sqrt{5} + 5$

23. $\dfrac{\sqrt{3}}{\sqrt{5} - \sqrt{2}}$

a) 1 b) $\dfrac{\sqrt{15} + \sqrt{6}}{3}$ c) $\sqrt{5} - \sqrt{2}$ d) $\dfrac{\sqrt{15} - \sqrt{6}}{3}$ e) $\sqrt{5} + \sqrt{2}$

24. $\dfrac{\sqrt{a}+\sqrt{b}}{\sqrt{a}-\sqrt{b}}$

a) $\dfrac{a+b}{a-b}$ b) 0 c) $\dfrac{a+2\sqrt{ab}+b}{a-b}$ d) $\dfrac{a+\sqrt{2ab}+b}{a-b}$

e) $\dfrac{a^2+2\sqrt{ab}+b^2}{a-b}$

25. $\dfrac{11}{\sqrt{3}-4}$

a) $\dfrac{\sqrt{3}}{13}$ b) $\dfrac{4}{13}$ c) $\dfrac{\sqrt{3}+4}{13}$ d) $\dfrac{-11\sqrt{3}-44}{13}$ e) $\dfrac{11\sqrt{3}+44}{13}$

SOLVE THE EQUATIONS IN PROBLEMS #1 THROUGH #4 BY FACTORING.

1. $x^2 = 16$

   a) 4,-4 b) 8,2 c) 8,-2 d) 4,4 e) -4,-4

2. $3x^2 - 16x = -5$

   a) 1,3 b) $\frac{1}{3}$,-5 c) $\frac{5}{3}$,1 d) 1,2 e) $\frac{1}{3}$,5

3. $x^2 - x - 12 = 0$

   a) 4,-3 b) -4,-3 c) -4,3 d) 1,6 e) 4,3

4. $x^2 - 9x = 0$

   a) 1,9 b) 0,-9 c) 0,9 d) 0,8 e) -1,9

IN PROBLEMS #5, #6 AND #7, REWRITE THE EQUATIONS IN GENERAL FORM $ax^2 + bx + c = 0$ TO FIND a, b and c.

5. $2x^2 = x + 3$

   a) a = 2, b = 3, c = 1 b) a = 2, b = -1, c = 3 c) a = 1, b = 3, c = -2
   d) a = 2, b = -1, c = -3 e) a = 3, b = -1, c = 2

6. $x^2 - 7 = 0$

   a) a = 0, b = 1, c = 3 b) a = 1, b = 2, c = -1 c) a = 1, b = 0, c = -7
   d) a = 1, b = 7, c = 0 e) a = -1, b = 0, c = 7

7. $-3x^2 + 8x = 0$

   a) a = -3, b = 8, c = 0 b) a = 0, b = 8, c = 3 c) a = 8, b = 0, c = 3
   d) a = 3, b = -8, c = 0 e) a = 3, b = 0, c = 8

SOLVE PROBLEMS #8 THROUGH #14 USING THE QUADRATIC FORMULA. SIMPLIFY.

8. $3 = 7x - 2x^2$

   a) $\frac{7}{4} \pm \frac{1}{4}$ b) $\frac{1}{2}$,3 c) $-\frac{7}{4} \pm \frac{5}{4}$ d) $-\frac{7}{4} \pm \frac{1}{4}$ e) $-\frac{1}{4} \pm \frac{7}{4}$

9. $8x^2 + 4x = 1$

   a) $\frac{1}{4} \pm \sqrt{3}$ b) $\frac{1}{4} \pm \frac{\sqrt{3}}{4}$ c) $\frac{1}{4} \pm 4\sqrt{3}$ d) $\frac{1}{4} \pm \sqrt{4}$ e) $-\frac{1}{4} \pm \frac{\sqrt{3}}{4}$

10. $2x^2 + x = 1$

    a) $\frac{1}{4} \pm \frac{3}{4}$ b) $\frac{1}{2}$,-1 c) $\frac{1}{4} \pm \frac{\sqrt{3}}{4}$ d) $-\frac{1}{4} \pm \frac{\sqrt{3}}{4}$ e) $1 \pm \sqrt{3}$

11. $3x^2 - 16x = 0$

    a) $0, \frac{16}{3}$ b) $0, -\frac{16}{3}$ c) $1, \frac{16}{3}$ d) $-1, \frac{16}{3}$ e) $\frac{1}{3}, \frac{16}{3}$

12. $4x^2 + 1 = 4x$

a) $\frac{1}{2} \pm \frac{\sqrt{2}}{2}$ b) $\frac{1}{2}$ c) $\frac{1}{2} \pm \sqrt{2}$ d) $\pm\sqrt{2}$ e) $\pm\frac{\sqrt{2}}{2}$

13. $2 = 12x - 9x^2$

a) $\frac{2}{3} \pm \sqrt{2}$ b) $-\frac{2}{3} \pm \sqrt{2}$ c) $\frac{2}{3} \pm \frac{\sqrt{2}}{3}$ d) $-\frac{2}{3} \pm \frac{\sqrt{2}}{3}$ e) $\frac{2}{3} \pm \sqrt{3}$

14. $x^2 + 2x = 8$

a) 4,2 b) 4,-2 c) 4,1 d) 4,-1 e) -4,2

SOLVE THE FOLLOWING WORD PROBLEMS.

15. The square of a positive number plus the number is 72. Find the number.

a) 5 b) 6 c) 7 d) 8 e) 9

16. The difference of two positive numbers is 5. Their product is 24. Find the numbers.

a) 6,4 b) 12,2 c) 8,3 d) -6,-4 e) -8,-3

17. The length of a rectangle is 3 feet more than its width. Its area is 28 square feet. Find the width of the rectangle.

a) 8 b) 2 c) 14 d) 7 e) 4

18. The area of a square is equal numerically to twice its perimeter. What is the length of its side?

a) 2 b) 4 c) 6 d) 8 e) 10

19. A swimming pool is 8 yards longer than it is wide. If the area is 48 square yards, find the width of the pool.

a) 12 b) 4 c) 8 d) 6 e) 24

20. Two times the square of a positive integer increased by three times the integer is 44. Find the integer.

a) 11 b) 2 c) 22 d) 6 e) 4

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